INSIDE PERSPECTIVES:
An Analysis of EPA Region 1's College and DPW Self-Audit Initiatives

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Abbreviations

APWA	American Public Works Association
DES	Department of Environmental Services
DEP	Department of Environmental Protection
DPW	Department of Public Works
EHS	Environmental Health and Safety
EMS	Environmental Management System
EPA	Environmental Protection Agency
RCRA	Resource Conservation and Recovery Act
SPCC	Spill Prevention Control Countermeasure

1. EXECUTIVE SUMMARY

EPA New England recently launched similar tailored and targeted strategies to bring colleges and municipal departments of public works (DPWs) into compliance with environmental regulations. After undertaking high-profile enforcement actions in both sectors, EPA offered reduced inspection priority and elimination or reduction of penalties for disclosed violations to colleges and towns that conducted environmental self-audits of their facilities, disclosed violations to the EPA, and fixed violations in a timely manner.

In launching the self-audit initiatives, the EPA looked to exert leverage with key stakeholders at colleges and municipalities to overcome barriers to compliance. The EPA has asked us to speak with individuals at the facilities, and find out how the strategy worked from the inside. Through interviews with managers at 19 colleges and universities and 21 municipalities and with other key stakeholders, we sought to answer the following questions:

(1) What motivated managers to participate or not in the self-audit?
(2) In what ways did the strategy give managers leverage to overcome barriers to compliance?
(3) What do managers believe the strategy accomplished?

CONCLUSIONS FROM DPW INTERVIEWS

To address key barriers to compliance at DPWs, EPA may design policies that target some or all of the following leverage points. The self-audit strategy went far in accomplishing each of the following:

- Keeping key stakeholders informed about regulations,
- Gaining "buy-in" from managers,
- Gaining leverage with employees,
- Influencing town leaders,
- Helping managers to mobilize resources (financial and other),
- Maintaining flexibility in helping facilities achieve compliance while being strict about required outcomes.

Enforcement played a key role in the self-audit strategy: The threat of inspections and penalties motivated participation and helped managers mobilize funds and underscore for employees the importance of compliance.

Deadlines and formal commitment motivated action*:* The official commitment made by signing up for the self-audit and the looming deadlines to report and fix violations motivated swift action and helped stakeholders to prioritize compliance.

Participants viewed the self-audit as an "opportunity"*:* Contrasting the self-audit with the option of possible immediate inspection, many participants praised the program as the first time the EPA worked with communities to help them "proactively" achieve compliance. Non-participants were not as moved by this "opportunity".

Flexibility with deadlines increased participation*:* EPA's flexibility in offering extensions appears to have enabled a greater level of participation. Municipal managers face time constraints in working through requisite political and bureaucratic processes.

APWA partnership increased EPA credibility and connected EPA with the "right" people: The American Public Works Association (APWA) helped to reach key stakeholders and lent credibility to the self-audit initiative. Similarly, collaborating with states improved outreach. There may be other parties that could also help promote participation and compliance.

Consultants played a key role in filling gaps in knowledge: Where a key barrier to compliance at municipal facilities is ignorance of the rules, private consultants hired to conduct self-audits played an important role in explaining regulations to municipal staff and management.

One-time efforts provided many lasting benefits, yet ongoing barriers to compliance remain: The self-audit is a tool for mobilizing a one-time effort to implement new procedures, update facilities, and inform managers and employees of the rules. Many changes made will provide lasting benefits. At the same time, directors expressed concern about meeting future challenges – especially if the EPA turns its attention away from municipalities.

Non-participants appear to range from highly compliant to highly non-compliant and face similar barriers to compliance as participants, although the non-participating managers tended to be far more critical of EPA and regulations.

CONCLUSIONS FROM COLLEGE INTERVIEWS

Barriers to compliance varied in significance according to school size. Lack of faculty buy-in was most commonly cited as a challenge among larger schools. Smaller schools commonly cited insufficient resources and ignorance of regulations. There were no noticeable differences in the barriers that confronted participants and non-participants.

High profile enforcement actions motivated action: The threat of enforcement actions compelled colleges to pursue environmental improvements prior to the formal self-audit initiative and to sign up for the self-audit.

Almost all non-participants interviewed believed EPA inspections posed little risk: Some non-participating schools believed their facilities were too small to attract EPA attention; others believed that inspections posed little risk since their facilities were already in compliance; one said that it was worth the risk of inspection to gain more time to achieve compliance than the self-audit program afforded.

Self-audits and EPA workshops influenced colleges' activities in ways that additional enforcement actions could not: Interviews with EHS directors and consultants suggest that EPA self-audits and workshops encouraged colleges to be proactive about improving their environmental performance.

Self-audit initiative gave some EHS departments leverage with administrators and faculty: Self-audits and the threat of inspection allowed EHS departments to justify additional funding requests. Additionally, the self-audit was a tool for EHS departments, with the help of consultants, to review faculty practices in hazardous waste management.

The program compelled many facilities directors to make their environmental responsibilities a priority: By signing-up for the self-audit initiative, facilities directors committed themselves to their environmental priorities.

Most colleges reported slight improvements as a result of the self-audit program: At many colleges, self-audits resulted in capital improvements, increased regulatory knowledge, greater faculty or administrative buy-in, and/or temporarily enlarged EHS budgets.

Some benefits of self-audits may be temporary: Interviewees believed maintaining the momentum of the self-audit would be a key future challenge. Specifically, interviewees at smaller colleges expressed concerns about keeping up with regulations as their facilities expand and laws change.

2. INTRODUCTION

The EPA New England Region recently launched similar tailored and targeted strategies to bring colleges and municipal departments of public works (DPWs) into compliance with environmental regulations. EPA began by inspecting a number of schools and towns and publicizing the resulting six-figure penalties. Following the high-profile enforcement actions, EPA offered facilities in these sectors an opportunity to achieve compliance with a low risk of inspections and fines. Facilities could sign up to undertake a self-audit of their operations for compliance with environmental regulations, disclose all violations found to the EPA, and fix those violations in a timely manner. In exchange, EPA would grant them "low-inspection priority" status during the self-audit and would substantially reduce or eliminate penalties for disclosed violations. After the self-audit is completed, facilities would return to regular inspection status.

EPA promoted the initiative by mailing letters to college presidents, school environmental managers, town/city managers and DPW directors and by hosting workshops throughout New England. For the municipal initiative, EPA collaborated with the New England Chapter of the American Public Works Association (APWA) to promote the self-audit. Half of New England's 286 colleges and more than twenty percent (over 250) of New England's 1,087 municipalities signed up for the self-audit.

EPA is now concluding the formal self-audit initiatives and evaluating their effectiveness in these sectors. As part of the evaluation, the EPA has asked us to speak with members of the regulated communities to see what we could learn about:

(1) Why managers chose to sign up or not,
(2) What kinds of leverage it gave them in overcoming barriers to compliance, and
(3) What they believe the strategy accomplished?

The self-audit strategy differed from the traditional approach to compliance, which is to enforce rules primarily through inspections and enforcement actions. The theory holds (Becker 1968) that profit-maximizing firms will comply with regulations if the expected cost of enforcement action exceeds the cost of compliance.[1] Firms estimate expected costs by multiplying the probability of detection by the size of the penalty. This theory may go far in explaining firm behavior and provides a persuasive justification for a regulatory approach based on inspections and fines, but in treating firms like "black boxes", it fails to consider a range of internal factors that can be leveraged to increase compliance. When regulators look within firms and consider a broader range of potential leverage points, they gain a richer toolbox of policy approaches.

In launching the self-audit initiatives, the EPA looked beyond the "black box" to design tailored strategies that would exert leverage with key stakeholders at colleges and municipalities to

[1] Becker, Gary. "Crime and Punishment: An Economic Approach." *The Journal of Political Economy* 6.2 (1968): pp. 169-217.

overcome barriers to compliance. The EPA has asked us to go beyond the "black box" as well, to understand the ways that the self audit strategy affected key players and gave them tools or leverage to achieve results.

To fulfill this mission, we conducted interviews with representatives of 19 colleges and universities (10 self-audit participants; 9 non-participants) and 21 municipalities (10 participants; 11 non-participants), six environmental consultants who conducted the self-audits, and other stakeholders. We selected our sample to gain a broad range of views. Thus, we contacted people at schools large and small, public and private, in all six New England states. Likewise, we spoke with municipal managers in small towns and large cities, affluent and low-income, also in all six states.

The samples are not large enough or randomly selected to yield statistically significant results, and since not all of the individuals we targeted for interviews returned our calls, the individuals we spoke with may not be fully representative of their communities. At the same time, our aim was to gain a general understanding of the sectors, the challenges they face in achieving compliance, and self-audit participants' views of the self-audit approach, which we feel we were able to accomplish – and we acknowledge in our analysis where our conclusions may be limited.

In addition, we would like to emphasize that the perceptions held by members of the regulated community are not the final word in regulatory compliance – it is only one part of the picture. Some interviewees may have been misled about the compliance status they reported to us; others may have wanted to understate violations. A manager might see a certain rule as trivial that might in reality be a key protection against pollution. Our interviews were not a survey to determine facilities' actual compliance status, but an exploration of the ways environmental compliance works in the field and the lessons EPA can learn about key leverage points in this sector and how the self-audit addressed them.

The briefing book first reviews the experiences at municipalities, and then looks at colleges and universities. We explore the following questions in both sectors:

- What barriers to compliance do the regulated facilities face?
- What reasons did managers and EHS directors give for their participation/non-participation in the self-audit?
- How did managers and EHS directors view the effectiveness of the self-audit in improving environmental performance?
- In what ways did the self-audit address the key barriers to compliance identified by managers and EHS directors?
- How did managers and EHS directors view the probability and consequences of inspection?
- What are the key take-away lessons for EPA to gain from stakeholders inside the regulated facilities about how the strategy worked?

3. METHODOLOGY

We conducted interviews with representatives of nineteen New England colleges and universities, twenty-one New England municipalities, six consultants involved with the self-audit initiative, three contacts at state environmental agencies in Maine, Vermont and Connecticut, and a past president of the New England Chapter of the American Public Works Association (APWA). Interviews typically lasted around 20 minutes and addressed a range of issues, including environmental management challenges, relationships with the EPA, perception of the probability of EPA inspection/enforcement action, reasons for participation/non-participation in the self-audit initiative, and changes in environmental performance. The actual questionnaires can be found in Appendix 1.

We informed interviewees that we are Harvard graduate students working on a thesis that will be presented to the EPA. We assured interviewees at colleges and municipalities that we would not attribute their comments and that we would not name their schools or towns in the report.

We designed the sample to include individuals who we believed would offer us a range of perspectives. We did not aim to achieve statistical significance in the results as the sample is small and the selection was not random. Additionally, the sample may yield self-selection bias, as some individuals did not return our calls.

3.1 Departments of Public Works

We interviewed representatives from 21 municipalities – 10 participants in the self-audit program and 11 non-participants. We selected municipalities with a range of populations, median household incomes, and geographic locations to gain a broad and roughly representative range of views. A breakdown of the towns in the sample by population, mean income, and state can be found in Figures 1, 2, and 3 below. We spoke with 17 directors, commissioners, assistant commissioners, and facility managers at departments of public works, two directors of highway departments and one chief of a fire department. At one non-participating city, we spoke with an Environmental Coordinator whose responsibilities were citywide but included the DPW and municipal garages. We placed calls to more participants and non-participants than we ultimately interviewed. Two participants and two non-participants did not return our calls. One non-participant deliberately declined to speak with us. We also did not interview three non-participants who returned our calls after we had concluded our research.

In addition to contacting municipal representatives, we interviewed three environmental consultants who had, together, been hired by more than 80 facilities to conduct the self-audits. Finally, we contacted Rick Stenson, past President of the New England Chapter of the American Public Works Association (APWA), who had helped to promote the self-audit program to municipalities.

3.2 Colleges and Universities

At the colleges and universities, we spoke mostly with Environmental, Health and Safety (EHS) directors – some who led a whole departmental staff, and others who alone carried EHS responsibilities. At schools with no EHS officer, we spoke with facilities managers for whom EHS was one of many hats.

We selected schools to represent a mix of state, small private, large private, and community colleges. Although every college is unique and faces distinct environmental challenges, we felt these four strata, while fairly broad, were discrete enough to capture significant variations across groups.

Private colleges tend to have more flexible budgets and larger endowments than public schools, while public schools are subject to certain state environmental regulations from which private schools are exempt. Based on student population, we further divided private universities into "large" schools (more than 10,000 students) and "small" schools (fewer than 10,000 students). Larger schools tend to have more advanced research labs that produce larger quantities of hazardous waste. The sample of public schools included both community colleges and state schools for similar reasons. Community colleges have fewer, smaller, and less advanced labs than state schools. Additionally, because community colleges have smaller campuses than state schools, their more limited activities are covered by fewer EPA regulations. Municipalities often manage community college environmental services such as general waste disposal and storm water management.

In constructing the interview sample we selected a number of self-audit participants and non-participants from each of these strata. A breakdown of the sample by college type can be found in Figure 4 below. We also selected colleges such that each of the six New England States was represented. So that the identities of the college interviewees remain confidential we have not provided a table that shows the distribution of interviewees according to state.

Figure 1: DPW Interview Sample by Population

	Under 25,000	25,000-49,000	50,000-99,999	100,000+	Total
Participant	3	3	2	2	10
Non-participant	5	2	4	0	11

Figure 2: DPW Interview Sample by Median Income[2]

	Under $40,000	$40,000-50,000	$50,000-60,000	$60,000+	Total
Participant	1	3	5	1	10
Non-participant	4	2	2	3	11

Figure 3: DPW Interview Sample by State

	MA	NH	VT	CT	ME	RI	Total
Participant	3	1	1	2	1	2	10
Non participant	4	3	1	1	1	1	11

Figure: 4 College Interview Sample by Type

	Small Private Colleges	Large Private Colleges	State Colleges	Community Colleges	Total
Participant	3	1	3	3	10
Non-Participant	4	2	2	1	9

2 According to 2000 US census

4. SUMMARY & ANALYSIS OF RESULTS: DPWS

4.1 Barriers to Compliance

The municipal interviewees identified five key barriers to complying with environmental regulations:

1. Lack of knowledge of the regulations,
2. Lack of buy-in among city leaders, DPW heads, and facility staff,
3. Cost of compliance,
4. Unclear language of the regulation, and
5. Unreasonable regulations and regulators.

The most common responses referred to lack of knowledge, buy-in, and cost. A few interviewees also cited the "legalese" and unreasonableness of regulations as key challenges in achieving compliance. Several interviewees explained that meeting the new "Storm Water Phase II" requirements by the March 2003 deadline is a key challenge. While the storm water requirements were not in place during the self-audit initiative, they did inform the interviewee's responses, and were cited by those who said that regulations can be unreasonable.

4.1.1 Knowledge and understanding of regulations

Most of the interviewees explained that simply learning about the regulations – existing and new ones – is a key barrier to compliance. We heard many comments about EPA lacking a communication or outreach mechanism. For example, one director commented: "EPA did a poor job of letting cities and towns know about regulations. They thought the existence of a regulation was enough." Many interviewees explained that they cannot "fish for information" and that they do not have staff dedicated to compliance who can track the rules. Some of the managers noted that they could be out of compliance with certain rules and would have no way of knowing it. One consultant who audited 45 facilities in Maine said that, with a few exceptions, they were all "on equal footing" with regards to their lack of knowledge of regulations.

> "If and when the rules change, we need to be notified. We can't go fishing for information. We have no problem complying as long as we know."

One facility manager described being taken out of operation after a surprise DEP inspection. His facilities violated a rule that had changed without his knowledge. He commented that he would have no problem complying if he knew the rules. Reflecting on similar situations, one consultant explained: "In my field I've seen lots caught who pay the fine but never knew that they were doing something wrong. They would have done it right if they had known."

4.1.2 Cost of compliance

While DPWs can achieve compliance with some rules through minor procedural changes, other rules may entail capital investments or costly improvements. Many of the interviewees noted that they are competing for funding with other valuable city priorities, and securing funding can

be a slow process that requires the buy-in of town council or the town manager. One DPW director explained: "It is tough; it is a money issue. Our money is from the general fund. We are competing with the school, police and fire department…. We are competing with schoolbooks."

In addition, four interviewees mentioned that updating old facilities or replacing them with new facilities can be a challenge – implicitly because of the cost. One manager explained: "To be 100% in compliance…the costs would be astronomical. I'd be in a whole new facility…. The old facility really doesn't meet what they are after. We just kind of make it work."

4.1.3 Buy-in among city leaders, DPW heads, and facility staff

Most of the interviewees named lack of stakeholder buy-in (from town leaders, department heads, or facility staff) as a key barrier to achieving compliance. We heard from many of the department directors about the challenges of changing the habits of their employees – they explained that employee buy-in and on-going training is critical to meeting requirements. One DPW Commissioner said: "One of the biggest challenges is educating employees at facilities, especially when some of them have been there for years. You need to change habits." Along the same lines, another DPW director explained: "People are working at the garage for 20 years and they say this is how they have always done it. We have to retrain employees that they need to be aware of these issues."

The consultants and the one EHS officer we interviewed emphasized the importance of buy-in from departmental leaders; the DPW directors themselves did not cite this issue. One consultant explained that when a manager is motivated by fear of inspection rather than an authentic appreciation of the regulations, then that manager will "sweep things under the rug, trying to get out from under the microscope." Finally, many of the interviewees explained that buy-in from town leaders (town managers or members of town council) is needed to secure funding.

4.1.4 Problem of " legalese"

Three of the interviewees noted that the regulations are unclear and that it is not easy to get clarification about the requirements. One DPW director explained: "The regulations that are passed down to us are usually so encumbered with legalese that they are virtually indecipherable. There is education needed to simplify what they are trying to say." Another commented that he has "never met anybody who can make heads or tails of the federal registry."

4.1.5 Unreasonable regulations and regulators

Although most of the interviewees noted that the regulations are reasonable, a few (all non-participants) identified unreasonable regulations as a barrier to compliance. The same interviewees noted that regulators can be unreasonable and inflexible in their enforcement of the regulations. One manager of a highway department explained: "They know the rules don't make sense but nobody will correct it. We ask what alternative plan we can come up with, but they say 'this is the rule'. People have a hard time complying with that." A DPW manager commented: "The compliance issues…are environmentally based, but there is usually no thought given to the practicality of what they are asking, and as with most federal mandates, they are unfunded.… Storm Water Phase II is at the forefront as the most obvious example right now." Another manager said: "They approach you as the final word. They don't say 'here is what we

want, what can we do to get there? What would be reasonable?'… Their intentions are the best. Their approach is wrong."

4.2 Reasons for Participation

Most facilities cited two main reasons for participating in the self-audit:

(1) To avoid fines for non-compliance and

(2) To make the workplace safe and protect the environment.

In addition, almost every participant mentioned that the American Public Works Association (APWA) encouraged participation. A couple of participants noted that the state (Maine and New Hampshire in particular) also promoted the program. One participant said that the insurance company recommended participation. The consultants each noted that EPA flexibility with timelines enabled more facilities to sign up than would have otherwise.

4.2.1 Avoid fines

The most common response, and usually the first cited, to the question "Why did you choose to participate?" was the desire to avoid fines. Several managers noted that other municipalities, most notably Natick, had been fined for violations. For example, one DPW director in Maine said: "A couple of public works facilities in Massachusetts got hit with really bad fines…. Their management was looking the other way. This really spurred us." Interviewees explained that it would be more "cost-effective" to do the self-audit than wait for the EPA to find their violations. One administrator explained: "From the training it was my understanding that EPA would make an effort to come to facilities and inspect, and the self-audit would allow us to be in compliance before the EPA came out and did its own audit."

"A couple of public works facilities in Massachusetts got hit with really bad fines…. Their management was looking the other way. This really spurred us."

One manager noted that a benefit of the self-audit is that no fines are attached to violations discovered during the self-audit: "I'm being proactive to bring facilities into compliance and to avoid fines…. You got to understand that [the self-audit program] is not a free thing. The town expended funding to perform the self-audit as well as to come into compliance with the results of the audit. The nice thing is that there are no fines attached to the violations that were found."

4.2.2 Consistent with environmental values

While some of the non-participants spoke about costly and unnecessary 'un-funded mandates', most of the participants expressed that the regulations were reasonable and that they were happy for the opportunity to make their workplaces safer and cleaner for the environment by meeting the requirements. Most of the interviewees who cited the desire to avoid fines as their first reason for participating would then make comments such as "environmentally it is the right thing to do." A fire chief explained that he could not enforce compliance among others if he is not in compliance himself. Another director said that participation would provide justification to secure funds for cleanup from town council.

One commissioner explained that her primary motivation for participation was environmental protection: "One of my priorities is safety and environmental protection…. I saw the audit as an opportunity. The threat is always there I guess for a regulatory agency to come in and inspect.

For me, I want to be a safe department." She explained that she and the management staff are new, and that the audit served as a tool to understand what is really going on in the facilities.

4.2.3 Encouraged by the APWA and others

Virtually every interviewee noted that the New England Chapter of the American Public Works Association (APWA) encouraged participation in the self-audit. Many had attended compliance trainings put on collaboratively by the APWA and EPA. One participant said that the New Hampshire Department of Environmental Services (DES) and the insurance carrier recommended that the DPW participate. Another participant commented that the Maine Department of Environmental Protection (DEP) and Department of Transportation promoted participation.

4.2.4 EPA flexibility

The consultants explained that EPA's flexibility with deadlines was an important factor in signing facilities up for the self-audit. Along these lines, several of the facility directors noted that the slow pace of municipal government approval can be a hurdle in obtaining compliance in a timely manner. One non-participant said that the facility was not able to secure funding in time for the EPA deadline. A participant explained: "The federal government doesn't move so fast either. Do they think we can move faster than the federal government? They should be understanding of the constraints we have." It appears that EPA's flexibility with the timeline did enable more participants to sign on than might have if EPA held to its original deadlines.

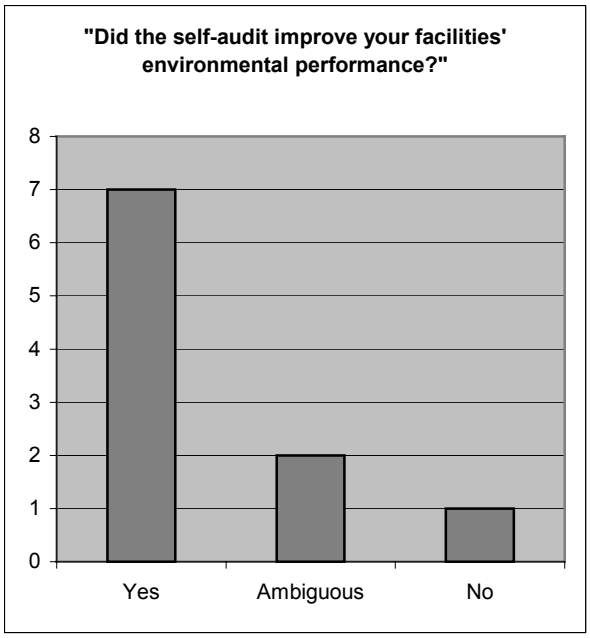
4.3 Self-Audit Impacts on Environmental Performance

The majority of the participating department managers said that the self-audit was an effective tool for improving environmental performance. In particular, they discussed the ways the self-audit helped them to identify gaps in their regulatory knowledge, educate and raise awareness among employees, institute new procedures, and motivate town leaders to allocate funding for capital changes and costly improvements. Interviewees also identified the limits of the self-audit program: they indicated that challenges remain in learning about new regulations, keeping employees from becoming complacent, and securing funding to meet new regulatory standards.

4.3.1 Perceived impact of self-audits

In response to the question of whether the self-audit changed the environmental performance of participating facilities, seven of the 10 participants said yes, two gave ambiguous answers, and one (who conducted the self-audit himself, not hiring a consultant, and who has not yet submitted the paperwork) said no.

The most common affirmative answer referred to the role the self-audit had in educating employees about the rules. We heard comments such as "Yes, the town now has a better understanding of the rules and regulations" and "Absolutely. There is much more acute awareness of the EPA requirements." One DPW director explained: "Absolutely. One of the biggest benefits I saw as a manager was the employee recognition that this is important…. The law requires it; common sense requires that these things be done. The employees need to do the monitoring. They realized that through the program. It was a huge benefit." To answer the question some of the interviewees also listed specific procedural changes that have been made due to the self-audit.



The two ambiguous answers also referred to increased awareness of the regulations, although these respondents expressed less confidence that their environmental performance had improved. One of the ambiguous answers came from a participant who had not hired a consultant, but had a representative from the state conduct the audit at no cost. He said: "I don't think it [our environmental performance] has changed as much as we are more aware of it." The other ambiguous response was: "I think employees are more knowledgeable now about how to handle byproducts, but that has been over the years…. We are still in the process of addressing it. We don't know at this point if what we have done will meet all of the requirements."

4.3.2 Capital and procedural improvements

In response to a range of questions, the interviewees described a number of procedural and capital changes made to come into compliance. Most of the formal procedural and capital changes are summarized in the self-audit reports, and can be aggregated from those to gain the 'full picture' of changes made. In addition to what was reported, many of the interviewees noted that during the self-audit they made small changes immediately upon identification of non-compliance, such as labeling changes, that they did not report. To verify that the claims made in the self-audit reports generally represent the actual compliance status of facilities, the EPA would need to conduct random verification inspections. One state contact commented: "Whether the self-audits were done correctly or comprehensively, we can't say because we didn't review them. But the consultants are credible. We have no reason to question them." One of the consultants commented: "We wrote the letters and the towns certified them. We did not see the final letter that went to the EPA. We couldn't see if they were admitting all violations. We just made the recommendation of full disclosure."

Managers noted in the interviews that they made the following types of changes: institutionalized regular walkthroughs and monthly self-inspections, improved record-keeping, created new supervised procedures for oil and gasoline delivery, began stockpiling fewer chemicals (keeping on hand only what is needed), began tracking of waste oil, improved spill mitigation techniques, created spill prevention control countermeasure (SPCC) plans, purchased equipment for secondary containment devices, implemented new labeling practices, disposed of waste materials that had been stored on site, instituted new disposal method for oil soaked rags, constructed new storage facilities, and blocked off floor drains.

4.3.3 Addressing Barriers to Compliance

Participants discussed ways in which the self-audit did and did not address their key barriers to compliance: (1) lack of knowledge of the regulations, (2) lack of buy-in from city leaders, DPW heads, and facility staff, (3) cost of compliance, (4) unclear language of the regulations, and (5) unreasonable regulations and unreasonable regulators. Specifically, they described how the self-audit helped them to learn about the regulations, gain buy-in from key stakeholders, and secure funding. Many of the participants also noted that their views of the regulatory agencies improved. At the same time, facility managers expressed concern that they still have limited ability to track changing regulations; many acknowledged that maintaining the new housekeeping procedures requires ongoing vigilance; and the challenge of securing capital funds to bring old facilities up-to-date remains a long-term concern.

Lack of Knowledge of Regulations

Many participants lauded the self-audit as an opportunity to learn the rules. Given that most of the participants had emphasized that ignorance of the rules is a major barrier to compliance, this appears to be an important achievement of the self-audit initiative. Eight of the ten participants we interviewed hired consultants to do the self-audit, and many explained that they needed the consultants for their expertise. One facilities manager concluded: "The town now has a better understanding of the rules and regulations."

At the same time, it appears that most facilities still lack a mechanism for learning about new regulations or existing regulations that apply to new activities. One consultant said: "I do believe for some places, they now understand the rules and will comply. If they do something new or change something, though, they won't know what the requirement is." Expressing a sentiment we heard from several managers, one DPW director said that a key future challenge is "keeping up with new regulations. Through this project we've been looking at all of the various rules and complying with them, we're becoming more aware, but anything new is another story…" Another commented: "We need ongoing partnership with regulatory agencies at the state and federal levels – to make sure that as changes happen everyone stays in the loop."

Lack of Buy-In From Stakeholders

***Employee buy-in**:* While many DPW managers identified the challenge of educating employees as a key barrier to obtaining environmental compliance, several managers explained that the self-audit program was an effective tool for getting staff on board with needed changes. One DPW director explained: "Our personnel, both mechanics and highway, are more aware of the need for environmental compliance, and they understand there will be disciplinary actions for their failure to comply." As noted above, the most common response to the question of whether the self-audit changed environmental performance was that the audit helped to educate employees.

A consultant who worked with 20 facilities commented: "Some of the directors say 'we've been trying to get certain employees to do this for 15 years'… We [consultants] would go through and explain the housekeeping to personnel. The result was changes in behavior. A lot of directors of public works knew things weren't being done, but … they couldn't explain why it is important…. Now employees know you have to keep it neat because it is a regulation." Another consultant commented: "Directors used it as an excuse to force employees to be in compliance."

While interviewees emphasized that the self-audit was an effective tool for increasing employee awareness of compliance responsibilities, several interviewees also noted that maintaining employee buy-in would remain a key future challenge. One manager commented: "The challenge is maintaining interest and preventing complacency."

***Town/city management buy-in**:* The program served as a tool for some department directors to secure support and funding from city managers and town councils. The self-audit created a "window of opportunity" to come into compliance; the distinct timeframe of the audit, even with extensions granted, motivated faster action by town management. Where some directors for years had been seeking funding to update a facility, they could use the self-audit as a tool to secure funding from budgetary managers by a deadline. One DPW director explained: "The storage facility for sand and salt cost $200,000 for construction. We have asked town council for many years for this. It was not looked at as a priority for town council. Because of the self-audit deadline, we were able to convince the town council to prioritize the funding for construction of the building." Another described a similar situation: "The audit gave us a clear justification to town council and

> "There was no question from the town council or manager that we had to spend that money. There is an environmental threat, a safety hazard, and it is the law. It was a great tool."

the town manager to dispose of chemicals – some of it, we didn't know what it was." A third director commented: "For me, I had the justification to spend $5,000 to $10,000 on cleanup. There was no question from the town council or manager that we had to spend that money. There is an environmental threat, a safety hazard, and it is the law. It was a great tool."

The consultants discussed this same issue. One summarized: "Many used this as an opportunity to get funding for what they wanted to do." Another commented: "There are a number who really want to comply. It gave them the opportunity to express to city council that this is important and that they can avoid fines down the road."

Buy-in from department managers: Consultants and the environmental coordinator we interviewed emphasized that a key determinant of compliance status is the manager's commitment to it. The directors we interviewed did not explicitly speak to this issue, but by discussing their perceptions of the EPA, they indirectly addressed it. Half of the participants explained that their opinions of the EPA had improved due to their experience with the self-audit initiative. One participant said: "I found them to be a lot more reasonable to work with than in the past. They used to be the big guy on the block, they'd come in and hand out fines and now they are trying to work with people." Another commented: "I think it did change our perception of the EPA somewhat. It showed that they were willing to work with DPWs and communities to get the word out, do a proactive program, and ensure that communities are in compliance rather looking to levy fines and things of that nature." It is possible that, if directors' perceptions of the regulatory regime improved, then their willingness to comply may have also increased.

The other half of the participants who did not say that their views of the EPA had improved, emphasized that they have always viewed the EPA in a positive light, and thus their views have not changed. In these departments, managerial buy-in may never have been a barrier to compliance.

Also relevant to the issue of "management buy-in" is the allocation of responsibilities for environmental oversight. The managers we interviewed described few managerial changes due to the self-audit – no director adopted an EMS system, hired an EHS officer, or reorganized roles – but many did mention that new responsibilities for environmental maintenance were allocated among the staff.

<u>Cost of Compliance</u>

The self-audit initiative did not change the underlying costs of compliance, and many directors noted that securing funding remains a key future challenge to maintaining compliance, but the self-audit did provide new leverage and justification for securing financial resources for compliance. As noted above, the increased threat of inspections and fines made many managers calculate that the cost of compliance would be less than cost of non-compliance in potential fines. As one Project Administrator commented: "the penalties related to violations made it seem more cost effective to do the audit than to wait for the EPA to come in and find problems and give penalties." Also as discussed above, the leverage that the self-audit gave department directors in working with town managers and town councils helped them to overcome the barrier of costs. One DPW commissioner said: "I was able to earmark $65,000 for the ventilation system. It helps you make a case for the budget."

Most DPWs reported one-time increases in budget allocations to conduct the audit and make needed changes. A couple of DPWs noted a small ongoing budget increase. One manager reported: "It will have a big impact on our budget. We are in process of finalizing a capital improvement bond to fund the projects identified through the self-audit process. That is a one-time expense that gets built into the bonding costs. There may have been minor operational items, like the salt storage shed - we have funding in latest budget for that, less than $100,000. A lot of the work we did ourselves."

Although the audit was an effective tool for many to secure funding, several department managers identified cost as an ongoing challenge. One commented: "Compliance ratchets down as the regulatory thresholds get tighter. It gets more difficult to obtain compliance, particularly in communities where budgets are limited."

Unclear Language of the Regulations

Two of the three interviewees who cited the issue of "indecipherable legalese" and the challenge of clarifying regulatory requirements as a barrier to compliance were non-participants. During the interviews, participants generally did not explicitly address this issue in connection with the self-audit. A few participants did mention, though, that they were in direct contact with Nancy Barmakian, Regional Municipal Coordinator, at the EPA during the self-audit process. One commented: "She helped us muddle through the rules and regulations." To the extent that interpreting regulations was an issue for participants, the consultants likely played a large role in interpreting regulations for participants, in addition to the role played by Ms. Barmakian.

Only one interviewee described any problems with the consultants' knowledge of the law. She said: "The consultants understand from a technical point of view what to do, but they did not understand the law about the audit policy – the legislation that created the ability to self-audit. They gave incorrect advice. The consultants went to a one day training with EPA; they were informed about what EPA needed – they didn't understand the DEP issues." The three consultants we interviewed had all been in close contact with Nancy Barmakian. Her outreach and ongoing communication with consultants may have helped to clarify misunderstandings the consultants harbored. Our interviewees largely gave us the impression that the consultants were highly competent, but we are unable to evaluate their competence level, and we only seek to draw EPA's attention to the potential issue that arises when a strategy relies largely on consultants.

"Unreasonable" Regulation and "Unreasonable" Regulators

None of the participants described inappropriate regulations and unreasonable regulatory enforcement as key barriers to compliance, although we heard about this issue a few times from non-participants. Nonetheless, many of the participating directors noted that the self-audit process improved their perceptions of the EPA and the willingness of regulators to be "reasonable". One participant commented: "We are a city that works *with* the EPA. Maybe they can change their image so that others feel the same way." It appears that the self-audit was a step in this direction.

At the same time, the audit perhaps appealed to those with already favorable views towards environmental regulation. The participants largely described the regulations (as well as the regulators) as reasonable. One participating director explained that the self –audit did not change his views of the EPA: "Most government agencies, if you work with them, they'll work with you. We had a good relationship with them. I was willing to get it done and they would give us the tools and opportunity to get it done." Another facilities manager commented: "The EPA is there to do a good job and to help us with doing a good job. If we all work together it will be better for the environment, our employees, and the public we serve." These views contrast sharply with the opinion articulated by one non-participant: "Basically they [regulatory agencies] are not friendly organizations… Self-audit programs are real nice. They say, 'We are having a program, do it yourself.' Thanks for the help!"

4.4 Reasons for Non-Participation

The interviewees identified a range of reasons and considerations for not participating in the self-audit:

- *Already in compliance:* Facilities are already at a high level of compliance (most common response).
- *Unaware of self-audit*: Directors were unaware of the self-audit opportunity.
- *Unable to secure funding:* Director was unable to secure funding in time to participate.
- *Disclosure entails risks:* Disclosing violations to the public would increase DPW vulnerability.
- *Preempted by inspection:* DPW was preempted from participation by a surprise inspection.
- *"Buying time" to correct violations, or "hiding" violations:* Managers, consultants, and state contacts hypothesized (while no interviewee confirmed) that some towns opted against participation to "buy time" to come into compliance or to "hide" from the EPA and conceal violations.
- *Lack of "buy-in" with regulations and distrust of EPA*: Non-participants as a group expressed far more critical views of regulations and the EPA than participants did. Their lack of "buy-in" with the regulatory requirements and lack of trust of EPA may have influenced their decision.

Two interviewees who are new managers said that they did not know why their predecessors opted out of the program, although one conjectured that non-participation was due to the city's dire financial problems. Another director could not recall a reason for not participating; in fact, at first he recalled that his town *did* participate.

4.4.1 Already in compliance

DPW directors who know or perceive that their facilities are in compliance may not find it worthwhile to spend $2,000 to $5,000 on a consultant to conduct a self-audit. Three of our interviewees explained that they did not participate because they had reason to believe they were in compliance. For one, the DPW facilities were new and "state-of-the-art" – designed to reduce environmental impacts. For the second, the DPW had conducted another self-audit recently with the help of state technical assistance. For the third, past inspectors indicated that the DPW was in compliance. Two other non-participants also commented that they are highly proactive about meeting and going beyond regulatory requirements, although they did not specifically cite their compliance status as the reason for not participating.

A DPW Director explained who runs a relatively new state-of-the-art facility designed to address the full range of environmental risks said: "We took a look at the self-audit and we did not see the need to spend money to have a consulting firm come in and audit because we didn't see that we had issues…. We would especially welcome an inspection by anybody. We feel we would pass the inspection with flying colors, A-Plus!" A DPW director who performed a self-audit for the state explained: "A representative from DEP came in and we came up with a list of things

that needed correction. We're in compliance with current regulations. Our problem is in the future – what regulations come down the pike."

The environmental coordinator we spoke with in one city explained: "I was aware of the program and the DPW Commissioner was aware of the program. We didn't do it. It cost money… I cannot do the self-audit myself, I need to hire a consultant. As I said, we have a fairly nice and clean vehicle maintenance facility… I am comfortable saying so because DEP did an inspection."

> "We did not see the need to spend money to have a consulting firm come in and audit because we didn't see that we had issues…. We feel we would pass the inspection with flying colors, A-Plus!"

4.4.2 Unaware of the audit opportunity

Two interviewees had not heard of the self-audit – the director of a highway department in a small town in New Hampshire and the DPW Director in a small town in Vermont. While letters from the EPA went to every town, we cannot know if the letters landed in the right hands. One consultant explained: "One thing a lot of DPW directors said is that they heard about what happened in Natick, but they had not heard of the self-audit. I don't know why…. A lot of the people we spoke to said that they were not aware of the self-audit until the consultants told them about it…. I don't know why the clients missed it, but they did."

4.4.3 Unable to secure funding in time for the program

While the EPA did offer extensions to enable towns to participate that needed extra time to secure approval or funding, some towns may have been unable to mobilize resources that year to participate. One of our interviewees cited this issue, explaining: "The city did not choose not to participate, but the funding did not materialize…. If the self-audit program were still available, we would be looking at the self-audit program, but that would require a deadline extension."

4.4.4 Perception that disclosure of violations leaves municipality "vulnerable"

One non-participating director explained that his DPW opted out of the program because information publicly disclosed in the audit could be used against the DPW at a later time – during follow-up inspections or in other contexts. He explained: "The debate that occurred was that you report it and then they won't inspect for a couple of years which gives you the opportunity to find and fix violations before they can enforce. The other side is you are pointing out your deficiencies and making it easier for an inspector to come in two years and check… The self-audit opens a lot of issues and questions for debate that make a lot of people nervous." A director of a participating DPW said that her city's legal department expressed a similar sentiment "that we were leaving ourselves vulnerable, exposing our warts", but the she overrode their concerns.

4.4.5 Inspected prior to initiative

One director said that he had intended to participate but was preempted by an EPA inspection: "We were inspected by EPA prior to the deadline to sign up for the self-audit…. It was clear to us that they were trying to make an example of us to make sure other communities would comply. We had set up training for our people in order to assist them in completing the self-

audit. The inspection by EPA was completed before we had the opportunity to do the training and do the audit." He commented that the inspection did increase the DPW's compliance, but the "approach was heavy handed for the results they obtained."

4.4.6 "Buying time" or "hiding"

None of the directors said that they were "buying time" to come into compliance or "hiding" from the EPA, but several interviewees suggested that these were reasons that some municipalities did not participate. One DPW director speculated: "I think a lot of communities that did not participate had major items they needed to correct and felt like they would have more time if they did not participate in the program. They could buy themselves some extra time. It is like throwing a dart: Will they inspect or not?" The Vermont state contact hypothesized that "smaller towns are probably laying low, hoping they won't be discovered." One consultant explained that some facility managers "feel scared and hide things. They don't want to talk to the consultants – they think the consultants are connected to the EPA and will tell them about violations." Our sample size was small, and it is possible that managers who did not return our phone calls fell into this general category.

4.4.7 Negative perceptions of EPA and regulations

Among non-participants, we heard far more critical views of the EPA and regulation than we heard from participants; negative perceptions of the EPA and the regulations may have been a factor in decisions not to participate, even though it was not explicitly stated as such. One director commented: "My impressions of the EPA have not changed. I've been public works director and city engineer for 20 years, and I was engineering consultant for 10 years before that. The agenda of the EPA is politically driven … and the changes they request cannot be rationalized by costs the changes create."

One DPW director who had stated that he did not participate in the self-audit because his facilities are already in compliance, later commented in the interview: "Self-audit programs are real nice. They say, 'We are having a program, you do it yourself.' Thanks for the help!" He continued to express his concerns about EPA's regulatory approach: "They slap you around. I've been at public works for 30 years. The regulators who work for the state or EPA are generally right out of college. It is their first real job. They have a set of books and regulations, and they try to apply that and it doesn't always work. Also, you may have young individuals, now able to wield power, and they can tell the gray heads what to do and how to do it. It is regulation for the sake of regulation. Doesn't do anybody any good." Another non-participating director also expressed similar concerns: "You have two kinds of enforcement people. There is the overzealous person who likes the authority and there is the other person who is truly interested in improving the environment. Depending on who you get, it can be a difficult process."

"Self-audit programs are real nice. They say, 'We are having a program, you do it yourself.' Thanks for the help!"

4.5 Perceived Risk of Inspection and Enforcement Action

Since the threat of inspection and fines can serve as an incentive to participate in the self-audit and, in general, to comply with regulations, we asked all of the managers how they perceived the probability and consequences of inspection. We heard a wide range of responses. In general, participants and non-participants cited similar sets of perceptions. Many recognized that the probability of inspections had increased in recent years; some conjectured that the probability of an inspector visiting their facility in the future has now increased or decreased for various reasons; and some commented that the threat of inspection always exists and has not changed. Participants and non-participants who said that they are now in compliance emphasized that they are not concerned about inspections, and some said they would welcome inspections. Three interviewees implied that the inspections serve as a communication tool with regulators.

Many of the participants noted that the probability of being visited by an inspector has increased in recent years. One participant said: "I believed that as a government agency we were kind of exempt in that nobody would come and fine us. Over time I have learned that we are not above the law, so to speak." Another participant commented: "I almost think we are at more of a risk [of inspection] now. I don't know if that is because of the self-audit or changing times – I am more aware [of the possibility of inspection]."

Some of the non-participants also commented on the high probability of inspection. One director, who wanted to sign up but did not secure funding in time, commented: "The probability of inspections is very good... EPA will be out doing inspections." Another non-participant, who had been inspected himself, said: "Yes, there is absolutely a threat [of inspection], particularly when they go to municipalities like Natick. You see that happen and say 'nice', there is obviously a threat…. You are always looking over your shoulder." A non-participating director from an affluent community commented that he faces a high risk of inspection for a different reason: "I think that we enjoy a high risk because we have a very vocal community that is continually in contact with regulators."

Some interviewees stated that "there is always a risk of inspection" and that that has not changed over time, while a couple of managers, for different reasons, believe the risk of inspection has decreased since the conclusion of the self-audit. One participant explained: "The previous Region 1 director sent a letter saying it was going to happen. There was fear that somebody would walk in. I thought it changed after the change in administration. I don't know if it is their top priority anymore. I don't know if they are doing inspections, but I don't get the sense that they are." Another participant commented: "I think our risk of inspection now is probably fairly low because of our working relationship with EPA, what we have done and our response to what we did find." Expressing a similar sentiment, the non-participant with the new facilities commented: "I think they are looking for the old facilities that are 30 to 40 years old with leaking drums. I don't think this facility raises a red flag."

Participants and non-participants who believe they are in compliance emphasized that they are not concerned about inspections. One participant commented: "Right now if EPA drove up I wouldn't be concerned; doing the self-audit gave us a good handle on what we are doing."

Another participant said: "I would welcome inspections. It would show me that EPA is serious about enforcement of regulations."

Three interviewees, including one participant (who never handed in the self-audit paperwork to the EPA) and two non-participants, implied that they view inspections as a communication tool with regulators and a way to learn about violations. It appears that they did not view the potential fines as very steep. The participant said: "I don't view inspections as a risk but as a normal part of operation. There isn't a fear of penalties. I view it as a communication tool." A non-participating director commented: "I would welcome an inspection any day of the week. If we are doing something wrong, I want to know about it." Another commented: "We try to keep everything in compliance but we don't worry about it. If there is an inspection, so be it. We had an inspection on our underground storage tanks, nobody had told our people what to do, and we paid the fine. It's not huge, now we know what to do."

5. SUMMARY & ANALYSIS OF RESULTS: COLLEGES

5.1 Barriers to Compliance

College interviewees identified four key barriers to complying with environmental regulations:

1. *Faculty & staff buy-in:* Faculty members were either unaware of regulations or unwilling to follow through on them.
2. *Unreasonable regulations & inflexible enforcement:* EHS officers said that EPA regulations targeted the wrong types of behavior.
3. *Insufficient resources:* Some colleges lacked the staff, funding, or technology necessary to maintain compliance.
4. *Ignorance of regulations:* EHS officers had difficulty keeping up with the new or existing regulations that applied to the activities at their facilities.

Of the four, lack of faculty cooperation in carrying out RCRA mandated processes appeared to be the most common impediment – roughly two-thirds of the interviewees cited it as a major problem. Larger schools with more research labs more often cited problems with buy-in. Smaller schools more often cited ignorance of regulations and insufficient resources as barriers to compliance.

5.1.1 Faculty & staff buy-in

Twelve of the nineteen EHS directors interviewed, six participants and six non-participants, mentioned lack of faculty and staff buy-in as a major barrier to compliance. These EHS directors experienced difficulty convincing faculty and staff to comply with university rules dealing with the handling, storage, and disposal of hazardous waste in labs. Interviewees attributed lack of buy-in to the decentralized organization of their college and/or faculty apathy. Notably, all three of the community colleges in the sample that participated in the self-audit program did not mention faculty buy-in as a problem. The other two colleges that did not report a faculty buy-in problem were also relatively small institutions.

Decentralized organization: Six of the twelve colleges that experienced a lack of faculty buy-in explicitly cited the decentralized nature of their college's administrative structure as the root of the problem. These EHS directors dealt with an extremely large number of individuals who worked in laboratories and other environments where environmental safety was a concern, and they lacked well-defined communication channels with laboratory staff. Most of these EHS directors described their department as playing a consultative role in the storage and disposal of waste. Although EHS developed and helped implement procedures, the faculties were responsible for carrying them out. Some of these directors stressed that faculty understanding was not enough to ensure compliance – constant reminders and frequent training was necessary to ensure the proper handling of hazardous waste. Many of the directors also said they were experimenting with new administrative procedures to improve faculty buy-in. Generally, these procedures involved making the EHS more "user friendly" or packaging rules in such a way that they seemed clear and sensible. These colleges were both public and private and represented

some of the largest interviewed. All four had major research labs and student populations in excess of 9,000.

Faculty apathy: Eight colleges attributed their problems with faculty buy-in to a general lack of appreciation for EPA regulations. These EHS directors explained that many professors did not see EPA requirements for hazardous waste as "value-added" steps. Many professors believed they had developed "better" methods of hazardous waste storage and disposal. As one EHS director said, "It is difficult to get faculty to do anything in one, uniform way." Another commented, "One of the major challenges was convincing people that this [compliance] was a problem." Some types of faculty created more problems than others. Problematic professors tended to be older and, as the interviewees explain, many believed they were "above the law." These professors did not want others interfering with the way they ran their lab. One interviewee reported that the problem of overt faculty resistance had decreased significantly over the years. Older, recalcitrant professors retired and the younger professors that replaced them tended to be more sensitive to environmental concerns.

5.1.2 Unreasonable regulations & inflexible enforcement

Seven respondents, four of them program participants, cited unreasonable regulations and/or inflexible enforcement as a major barrier to compliance. These interviewees complained that while RCRA regulations might be applicable in industrial settings, they made no sense in the college environment where relatively small quantities of hazardous chemicals are utilized. Respondents suggested that performance based regulations or flexible EPA enforcement would improve overall environmental outcomes. First, flexible enforcement would allow for a more efficient allocation of EHS resources. Second, flexible enforcement would improve the overall attitudes of EHS personnel and faculty towards RCRA regulations. One interviewee remarked, "it is difficult for me to bring these regulations to faculty with a straight face."

5.1.3 Insufficient resources

Four small colleges, two participants and two non-participants, cited insufficient funding and resources as a barrier to compliance and performance improvement. Two of the four schools were community colleges. Overall, however, insufficient funding and resources did not appear to be a major problem for most colleges in the sample. Although many interviewees claimed they had to fight for funding, few claimed that their current budget was too low.

Interviewees reported that lack of funding and resources primarily resulted in insufficient staffing. These interviewees were typically facilities managers who also had EHS responsibilities. One of these interviewees explained: "EHS is a side-job for me. It often does not get the attention it deserves because I have to take care of other more immediate tasks." Another commented: "Doing environmental compliance out of facilities is a real challenge…many decisions are made from facilities perspective not an environmental perspective." These "multi-tasking" facilities directors had to be creative to maintain

"EHS is a side-job for me. It often does not get the attention it deserves because I have to take care of other more immediate tasks."

compliance. Two of them described hiring graduate or undergraduate students as interns to inspect laboratory facilities.

5.1.4 Ignorance of regulations

Nine of the nineteen interviewees, five participants and four non-participants, cited ignorance of relevant regulations as a major barrier to achieving compliance. These interviewees typically represented smaller state and private schools as well as community colleges. They attributed their difficulties to the sheer number of regulations they had to deal with on a daily basis. Almost all explained that, in today's regulatory environment, they need to turn to consultants, EPA staff, or other forms of outside assistance to keep up with regulations. As one interviewee remarked: "The regulations out there are always changing and you are not always aware of it." A consultant commented: "Every college faces almost every regulation in the book…. much of the challenge is just scope."

Overall, it seems that knowledge of regulations has become less of a barrier to compliance in recent years. Since EPA began pursuing enforcement actions in the sector, colleges have actively sought clarification and information on relevant regulations. Two interviewees pointed out that, up until a few years ago, there had been a wide gulf between Region I and college's interpretation of many regulations, especially RCRA. These interviewees went on to say that, in recent years, colleges and the EPA have come to an understanding about how these regulations would be interpreted and enforced. Nevertheless, five interviewees, all of them from smaller colleges, stressed that continued cooperation and communication with the EPA would be necessary to keep abreast of changing regulations.

5.2 Reasons for Participation

Participants interviewed cited three major reasons for participating in the program:

- *Threat of enforcement action:* Colleges wished to avoid fines for non-compliance.
- *Opportunity for improvement:* EHS officers saw the program as opportunity to secure funds and cooperation from faculty and college administrations.
- *Reputation*: Institutions believed their reputation would be tarnished if they declined to participate.

It was apparent from the interviews that the threat of enforcement action was the driving force behind most colleges' participation decisions. Although institutions often mentioned several motivations for participation, enforcement actions were mentioned first and emphasized the most. All of the consultants interviewed also stressed the importance of "the fear of the enforcement hammer" in compelling institutions to participate.

5.2.1 Threat of enforcement action

Seven of the ten self-audit participants interviewed explained they volunteered for the program to reduce their inspection priority. Many colleges intimated that, given the high risk of inspection, the self-audit initiative offered a cost-effective way of coming into compliance. The three consultants interviewed also emphasized that the threat of enforcement action compelled most colleges to participate.

Some of the colleges interviewed believed Region I had plans to inspect them in the coming year. They described what they thought to be highly probable EPA strategy that would make their campus a likely target for an inspection and enforcement action. Regardless of whether these schools were major research universities or small colleges, large quantity or small generators, public or private, they were convinced the EPA would target their type of institution next. As one interviewee remarked: "We felt the EPA had a list, and they were getting close to us."

Participation in the program gave these schools a year exemption from inspections and enforcement actions. Interviewees explained that the self-audit program offered an opportunity to "get their house in order" and fix potential violations before the EPA "arrived at their doorstep." Additionally, performing the self-audit and hiring an outside consultant allowed them to address some unanswered questions with regard to their compliance. Many interviewees intimated or explicitly said that it was more cost-effective to participate and immediately fix violations. As one consultant put it: "Schools were saying to themselves, 'we don't have the money to pay these fines, and, if we are caught, we have to pay to fix these violations anyway.'"

Another category of schools believed that abstaining from the program might lead the EPA to think they were out of compliance. As one interviewee stated: "If we didn't participate, the EPA might have thought we were hiding something." This fear appeared to intensify as the self-audit initiative progressed and more colleges volunteered for the program. As the pool of participants grew, the perceived risk of EPA inspection for non-participants increased. Some smaller schools were surprised that

"We felt the EPA had a list, and they were getting close to us."

they were even on the EPA's radar. They took the EPA's invitation to join the program as a sign that they might be next.

Consultants agreed that the threat of inspections drove colleges' decision to participate. One consultant put it bluntly: "without enforcement actions, no one would have participated."

5.2.2 Opportunity for improvement

Seven of the ten participants interviewed also saw the self-audit initiative as a window of opportunity. For these EHS officers, the self-audit represented: (1) a means to raise institutional consciousness about environmental issues, and (2) an opportunity to get an objective analysis of their facilities' environmental performance.

EHS officers used the threat of inspection implied by EPA letters and comments as a tool to motivate administrators and hesitant faculty members to take a more active interest in the environment. Both the self-audit participants that cited resource constraints as a major barrier to compliance joined the initiative to garner support from faculty and administration officials. Other participants made similar claims. EHS officers used the self-audit as an excuse to arrange meetings with faculty and administrators and stress the importance of environmental compliance.

EHS directors also saw the self-audit as useful tool to gauge organizational performance. As one interviewee commented: "We felt like we were not doing anything wrong, but we wanted to make sure that was the case." Echoing this sentiment, many EHS officers stated that participating was "the right thing to do" or was a matter of "good environmental stewardship." Notably, nine of the ten participants interviewed hired consultants to perform the self-audit. For the interviewees, these consultants served two purposes: (1) they provided an independent, objective analysis of their facilities environmental performance; and (2) they offered expert and up-to-date knowledge of relevant EPA regulations. Without an EPA sponsored self-audit initiative, many of these managers would have lacked the funding to hire outside consultants.

5.2.3 Maintain reputation

Two interviewees explicitly cited fear of bad press as a reason for participation. These institutions believed their reputation would be tarnished if they declined to participate. Even though they believed they were in compliance, these colleges thought that the press would interpret their non-participation as a sign they were "trying to get away with something."

5.3 Impacts on Environmental Performance

Interviews indicated that EPA enforcement actions initiated before and during the self-audits produced major changes in colleges' compliance status. Additionally, many interviewees reported small but tangible improvements in their environmental performance due to the self-audit initiative. Anecdotal evidence suggests that the self-audits, enforcement actions, and EPA workshops had a synergistic effect which increased overall environmental performance in the sector. In this section we will review the interviewee's descriptions of changes in their compliance status, and we will discuss the ways that the self-audits addressed barriers to compliance identified by interviewees.

5.3.1 Perceived impact of enforcement actions

Our interviews suggest that enforcement actions taken before the self-audit initiative compelled colleges to make regulatory compliance a priority and influenced many to devote more resources to their EHS departments. Six of the EHS interviewees and all three consultants interviewed remarked that they have witnessed a dramatic improvement in colleges' overall environmental performance in the last three to five years. One interviewee observed that, prior Region I's initiatives, "many colleges had been living outside of the law."

Four interviewees, mainly from small private colleges or community colleges, described how their institutions responded to the stronger EPA presence by dramatically improving their environmental performance. Two of these interviewees reported that their EHS budgets had been practically non-existent three years ago. All four schools had hired new staff and significantly increased EHS funding within the last three years to bring their facilities into compliance.

Specific improvements to environmental procedures and performance described by interviewees included:

- Creating centralized EHS departments;
- Significantly increasing EHS budgets;
- Conducting independent audits of facilities;
- Removing historical accumulations of hazardous waste;
- Establishing or improving spill prevention control countermeasures (SPCC);
- Improving labeling procedures for hazardous waste;
- Purchasing computer software to track hazardous waste;
- Improving the management of satellite accumulation areas; and
- Developing or laying the groundwork for environmental management systems (EMS).

5.3.2 Perceived limits of enforcement actions

It appears from our interviews that the self-audits and EPA workshops may have influenced colleges' activities in ways that additional enforcement actions could not. Specifically, self-audits and workshops prompted colleges to be more proactive about environmental concerns. One consultant said of the self-audits: "Enforcement actions leave a bad taste in people's mouths. They create an adversarial relationship. This kind of thing (the self-audit) is positive

for all involved. The self-audit allows people to go forward and get more done. Colleges have changed their attitude from 'you can't make me change' to 'how can we do more.'" Another consultant said: "Self-audits allowed colleges to take an objective look at their facilities, and move on after they fixed it [violations]. It allowed people to be proactive. It allowed colleges to raise awareness. But, without enforcement actions, no one would have participated."

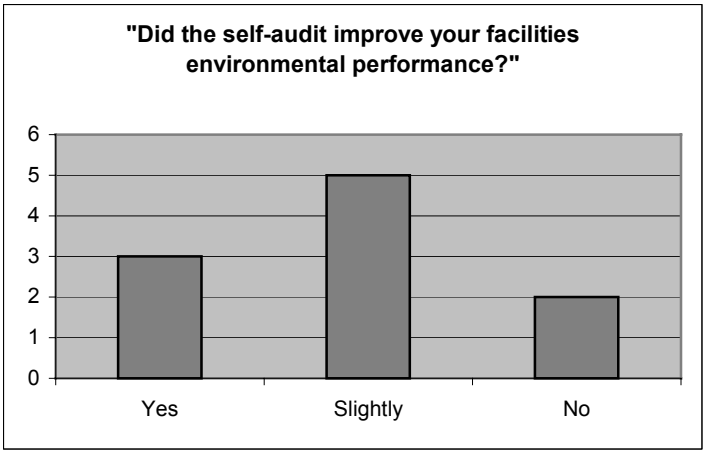
EHS directors echoed these sentiments. Commenting on the limits of enforcement actions, one interviewee said: "Saying the 'sky is falling' can generate a lot of initial support. However, it can't be used to continually maintain commitment." Another interviewee remarked that it was more politically palatable to approach his college's administration with proactive rather than reactive budget requests. The self-audit gave EHS departments a way to be proactive and, at the same time, to keep environmental performance on colleges' agenda.

5.3.3 Perceived impact of self-audits

In response to the question, "did the self-audit improve your facility's environmental performance," three of the ten participating colleges answered "yes," five answered "slightly," and two answered "no." All three consultants interviewed believed the program had a positive overall effect. They observed that some institutions, typically larger ones, pursued more far-reaching improvements as a result of the program.

Two of the three college interviewees who answered "yes" referred to the increased support they received from college administrators due to the self-audit initiative. After receiving EPA letters about the self-audit initiative, the presidents of these colleges made environmental performance more of a priority and granted their EHS directors' larger budgets and more authority. Another interviewee, a facilities manager with EHS responsibilities, claimed that the self-audit initiative made environmental performance more of a priority for him personally. Given the competing demands on his time, he often found it difficult to give environmental concerns the attention they deserved. The self-audit initiative compelled him to implement changes he had been planning for some time.

Five interviewees recognized "slight" improvements in their facilities environmental performances. These slight improvements were attributed to a variety of factors. Three interviewees mentioned that the audit's focus heightened the awareness of faculty; two stated that consultants exposed them to new environmental management procedures; and one said that the audit improved his organization's documentation of performance - which might lead to improved performance in the long-run.



Of the two interviewees who saw no change in their facilities' environmental

performance, one had conducted an independent audit just prior to the EPA's initiative. The other held an exceptionally negative view of EPA regulations. He believed there was a disconnect between the activities mandated by EPA regulations and the activities necessary to protect the environment. Although his organization's compliance status might have improved due to the self-audit, he claimed his facilities' environmental performance did not.

The three consultants approved of the self-audit because it (1) allowed universities to be proactive about environmental issues, (2) made colleges take an objective look at their compliance status, and (3) fostered a positive working relationship between the EPA and the academic sector. One consultant noted that the changes produced by the self-audits might have been limited to certain institutions: "I did not see dramatic improvements at every facility. The bigger facilities tended to have more improvement because they had the knowledge to fix violations." Another consultant echoed this sentiment, arguing that colleges need resources and the right attitude to get something out of the initiative.

5.3.4 Capital and procedural improvements

Interviewees from small, large, public, and private schools identified a number of procedural and capital changes they made during the self-audit to bring their facilities into compliance and keep them in compliance. These changes were smaller in scale than those prompted by enforcement actions. Interviewees noted that they did not report some small changes in their self-disclosure forms because (1) they did not involve a fineable violation, or (2) the violations involved were fixed immediately upon discovery. Most colleges did not increase EHS budgets to pay for improvements. Funding came from slack budgets, contingency budgets, or EHS tradeoffs. Some colleges had established the slack and contingency budgets as a response to EPA enforcement actions.

Capital changes were relatively minor in terms of scale. These changes involved acquiring technologies to manage the containment or disposal of waste generated by laboratories or other activities on campus. For example, three colleges purchased new or fixed old oil containment units. Two other colleges mentioned developing processes for disposing of new types of waste generated on campus.

A few colleges also described procedural changes resulting from the self-audit program. These changes typically involved more frequent inspections of research laboratories, satellite accumulation areas, or other environments in which hazardous waste could be found. Other procedural changes entailed better record keeping and improved labeling standards for hazardous waste. Interviewees explained that changes dealing with labeling were "cosmetic" and were not reported to the EPA in their self-disclosure forms. In one case, additional EHS interns were hired to conduct inspections as a result of the audit. In another, the audit revealed failings in activities managed by a department other than EHS and led to some reallocations of management responsibilities.

Most EHS departments made budgetary tradeoffs or dipped into contingency funds to pay for consultants, the remediation of minor violations, and the implementation of capital and procedural improvements. One interviewee's budget was temporarily increased by his college's

administration to pay for the audit. At one community college, the state system rather than the institution funded the audit. All but one of the interviewees described the extra expenditures or the tradeoffs as worthwhile. The dissenting interviewee complained that too much money went to lawyers and consultants.

5.3.5 Addressing Barriers to Compliance

At a few schools, the self-audits appeared to ameliorate the barriers to compliance identified by interviewees.

1. *Faculty & Staff Buy-in:* Self-audits gave EHS officers the opportunity to address and review the behavior of faculty.
2. *Unreasonable regulations & inflexible enforcement:* Self-audits and EPA workshops improved colleges' willingness to work with the EPA to identify and reduce environmental risks.
3. *Insufficient resources:* Self-audits temporarily increased EHS budgets and improved EHS officers leverage with administrators.
4. *Ignorance of regulations:* For the moment, consultants and EPA seminars improved EHS officers' knowledge of regulations that apply to their facilities.

Faculty & staff buy-in

EHS directors and consultants interviewed suggested that self-audits compelled relevant stakeholders at many colleges to support EHS departments' environmental goals. All three consultants observed that the self-audit served as a tool to increase faculty and staff buy-in at a few colleges. Although the EHS directors were generally less sanguine than the consultants, they did report improvements in buy-in due to the self-audits.

One consultant commented, "EHS officers don't want enforcement actions, but, at the same time, they wanted to use this [the self-audits and the threat of EPA inspection] to bring their organization into line." Another said, "Colleges got a lot out of the self-audits if they went in with the right intentions and carried them out correctly. Those who did it well came out with full administration backing and complete culture change. People were finally taking ownership of environmental responsibilities."

Directors at two universities explicitly mentioned using the program to improve faculty understanding of environmental goals and two other interviewees claimed that the audits improved their administrative support. The EHS director at a large New England university said of his self-audit: "We were not looking for minor violations, we were looking to correct the behavior of certain faculties." The other EHS director claimed that, although her self-audit revealed no major violations and very few minor violations, the initiative gave her the opportunity to address faculty on the topic of environmental compliance.

Unreasonable regulations and inflexible enforcement

According to many interviewees, unreasonable regulations and inflexible enforcement have led to inefficient allocations of EHS resources and a lack of cooperation between the EPA and the college sector. Although the self-audit initiative did not alter these unreasonable regulations or EPA's enforcement of them,[3] it appears to have increased colleges' willingness to cooperate with

[3]Through project XL, EPA is working with New England colleges and universities to develop innovative and cost-effective measures to manage hazardous materials in research laboratories.

the EPA. The self-audit initiative in conjunction with other compliance assistance and cooperative programs have contributed to a stronger partnership between colleges and the EPA

Five of the ten participants interviewed stated the self-audit initiative improved their perception of the EPA. These five interviewees generally remarked that they now thought of the EPA as more cooperative or more willing to help. Three interviewees mentioned that that the EPA was more responsive to complaints about the regulations. One interviewee said, "I used to think that one of the biggest lies around was, 'I'm from the government, and I'm here to help.' The EPA has changed my mind." Most of the respondents who viewed the EPA in a more positive light attributed their change of heart to particular people at Region I who they had met at an EPA workshop or through telephone conversations. Many of the interviewees who viewed the EPA in a more positive light pointed out that their relationship with Region I's enforcement arm was still inherently antagonistic. Nevertheless, most felt more comfortable talking with Region I personnel to clarify EPA regulations.

"I used to think that one of the biggest lies around was, 'I'm from the government, and I'm here to help.' The EPA has changed my mind."

While the EPA does not need the approval of the regulated to enforce the law, colleges that are more amenable to environmental regulations may be more likely to go beyond compliance and act as good environmental stewards. Indeed, some interviewees commented that interactions with EPA staff opened their eyes to the importance of certain regulations and caused them to alter their priorities accordingly.

Insufficient resources

Interviewees also reported that self-audit gave their department more leverage with college administrators. Because EPA notices about the program were sent directly to college presidents, administrators became more interested in environmental concerns. For example, one interviewee said that the self-audit helped him justify certain EHS expenses. Another said that administrators appreciated the program because it was a "proactive" way of addressing environmental challenges.

The self-audits did not produce permanent budgetary increases at any of the colleges interviewed. However, at many of the schools that cited insufficient resources as a barrier to compliance, one-time budgetary allocations were made to hire consultants and conduct the self-audit. Additionally, the self-audit also appeared to focus the environmental efforts of facilities directors responsible for EHS activities at small schools - for a period. These facilities directors had said that, because of their various other responsibilities, they had found it difficult to maintain compliance. The deadlines set by the self-audit initiative compelled them to place their EHS activities ahead of competing demands. As one participant remarked: "The self-audit motivated me to get things done. When we agreed to participate, I had put some things in place which I had intended to do for some time. The self-audit put these issues on the front-burner."

Ignorance of regulations

Six interviewees reported that the self-audit enhanced their knowledge of regulations applicable to their facilities. However, many cited keeping up with the regulations that applied to their expanding facilities as a key future challenge. Colleges gained additional information about regulations through EPA workshops, personal conversations with EPA staff, and consultants hired to perform the self-audits. Nine of the ten participants interviewed had hired a consultant to perform their self-audit. Broader understanding of the regulations prompted some of these interviewees to implement new environmental management procedures. For example, one college established a program to dispose of sulfuric acid from used batteries. Another overhauled its SPCC after learning about EPA requirements.

5.4 Reasons for Non-Participation

Interviewees described a number of factors that compelled them not to participate in the self-audit initiative. Interviewees mentioned one or several of these factors:

- *Self-audit program redundant:* Colleges had already performed independent audits to confirm their compliance status.
- *Lack of EHS influence:* Interviewees claimed that they would have participated if they had more influence over administrators' decision-making.
- *Minor risk of EPA inspection or fine:* Interviewees claimed that, because their colleges' operations were so limited, few EPA regulations applied to their facilities.
- *Out of compliance:* One interviewee said that, given his budget, he would need more time to bring his facilities into compliance than the self-audit program would allow.
- *Coordination problems:* One college wanted to participate in the program but failed to secure funding or submit paperwork on time.
- *Prior EPA enforcement action:* Colleges inspected and fined were already pursuing remediation under EPA supervision.

Non-participants attitudes towards the EPA did not appear to affect their participations decision.

5.4.1 Self-audit program redundant

One large private institution interviewed had already performed independent audits to confirm its compliance status and believed the EPA self-audit initiative would be redundant. The EHS director had been developing what he described as a comprehensive environmental program for the past eight years. The program involved working closely with the EPA, establishing and teaching best management practices, and ensuring compliance through routine inspections of facilities. The EHS director believed that his department was far enough along in the process such that an EPA self-audit was unnecessary. He also believed he had enough authority to influence the behavior of his faculty. He said of the EPA's self-audit offer: "Tenured faculty are not impressed by threatening letters. I would never take such a letter and show it to the faculty."

5.4.2 Lack of EHS influence

Two interviewees from very small schools claimed their departments' participation status would have been different if they had been able to contribute more to their colleges' decision-making process. These interviewees believed the self-audit would have been beneficial, but their administrators did not. At one school, the EHS director had been hired after the sign-up period for the self-audit had closed. He remarked: "I wonder if our decision would have been different if I had been here or we had had a more centralized EHS department at that point." The other interviewee was openly hostile to his college's decision. He intimated that he was extremely frustrated with his faculty's behavior and wished the EPA would inspect to bring them in line. At one point he remarked: "The lack of enforcement authority on my part as well as the lack of cooperation by administrators (particularly department heads) has made significant advancements in compliance difficult, to say the least."

5.4.3 Minor Risk of EPA inspection or fine

Three colleges declined to participate because they believed few EPA regulations applied to their facilities; consequently, they were unconcerned about the possibility of EPA inspections or fines. These colleges typically maintained only one or two laboratories on campus. Facilities managers explained that their operations were small enough such that they had little or no contact with the EPA. Although he was unconcerned with the EPA, one interviewee was evidently concerned with government regulations. He spent much of the interview describing the challenges associated with OSHA regulation.

5.4.4 Out of compliance

One small private school intimated that declining to participate was a cost-effective decision. The interviewee admitted that, given his budgetary constraints, he would need more time to bring his facilities into compliance than the self-audit program would allow. The college was actively trying to improve its environmental performance and had hired consultants to assist. However, the interviewee stressed that if he disclosed violations, he would not have the budget to meet EPA deadlines for remediation. The school had apparently taken the expected costs of EPA inspections and fines into account when formulating this decision. The interviewee said of the risk of inspection: "It is entirely possible at any time - inspection. I don't know how they pick schools."

5.4.5 Coordination problems

One interviewee reported that her school would have participated had it submitted paperwork and secured funding in time. Additionally, this school had conducted an independent audit in the past and believed its facilities were in "good shape" in terms of compliance.

5.4.6 Prior EPA inspection or enforcement action

Colleges that had already been inspected or fined were already pursuing remediation under EPA supervision.

5.4.7 Non-participants' attitudes towards EPA

Non-participants attitudes towards the EPA did not appear to have an effect on their participations decisions. Overall, non-participants held a positive view of the EPA. Interviewees spoke well of recent EPA compliance assistance programs, the Project XL program, and individual members of the EPA staff. Six non-participants praised the EPA for providing compliance assistance, answering their questions in a helpful manner, or listening to colleges' complaints about the regulations. One interviewee commented: "Before the college initiative, there was a feeling of disconnect between the EPA and colleges, the regulations did not necessarily apply to us. But the EPA is now an active listener. They have provided a lot of assistance. Before this [the initiative] complaints had fallen deaf ears."

Two interviewees who oversaw small facilities did not comment on their perception of the EPA since they had little or no exposure to the agency. Only one non-participant interviewed viewed the EPA in a negative light. This interviewee had been in the EHS business for several decades and believed that the EPA was "here to enforce, not help."

5.5 Perceived Risk of Inspection and Enforcement Action

Participants believed there was a high probability that EPA would inspect and fine their facilities if they failed to sign-up for the initiative. Non-participants perceived EPA inspection and enforcement actions as less of risk than did participants. Even if their facilities were inspected, non-participants believed EPA would find little or no violations.

5.5.1 Participants

Most participants believed there was a significant risk of EPA inspection if they did not participate in the program – seventy percent of the participants interviewed said they performed the self-audit to reduce their inspection priority. Although most of these interviewees were satisfied with their facilities' environmental performance, they worried that the EPA might fine them for minor regulatory violations. Given the high probability of inspection, these colleges believed they would pay to fix violations whether or not they participated in the self-audit initiative. Thus, the initiative enabled them to come into compliance without heavy fines.

Perceptions of the risk of post-self-audit inspections were also fairly uniform. EHS officers stated that "there is always a risk" of EPA inspections, but most declined to speculate on the probabilities. Despite their vague definitions of the risks, these EHS officers claimed that they always had to be prepared for an inspection. There were notable exceptions to this trend. Those colleges who had been inspected by the EPA in the past tended to believe that the EPA would be back.

5.5.2 Non-participants

All but one of the non-participants interviewed appeared unconcerned with the possibility of an EPA inspection. This lack of concern stemmed from interviewees' belief that their facilities were in compliance and/or the EPA was flexible about enforcement and fines.

Three interviewees remarked that potential fines would be small because the EPA would be flexible when assessing violations. One of these three said: "Based upon recent history the EPA is not zealous about inspection. They are now focusing on assistance… Not that they would not hold my feet to the fire, but the more you disclose the more they can help." Another remarked: "Inspections are not as much of a risk as they were five years ago…. The agency [EPA] has come a long way in giving colleges flexibility with RCRA violations. They realize colleges are dealing with test tubes, not barrels and tanks."

Another set of interviewees believed the EPA would find nothing to fine. An interviewee from a large college who had conducted independent audits for some time believed with certainty that his facilities were in compliance. Three interviewees believed their facilities were so small and their laboratory activities so limited that, if there were fines, they would be minimal. Colleges inspected prior to the self-audit initiative had already taken care of their violations and did not appear worried about future surprise EPA inspections.

6. CONCLUSIONS & LESSONS LEARNED: DPWS

To address key barriers to compliance at DPWs, EPA may design policies that target some or all of the following leverage points. The self-audit strategy went far in accomplishing each of the following:

- Keeping key stakeholders informed about regulations,
- Gaining "buy-in" from managers,
- Gaining leverage with employees,
- Influencing town leaders,
- Helping managers to mobilize resources (financial and other),
- Maintaining flexibility in helping facilities achieve compliance while being strict about required outcomes.

Enforcement played a key role in the self-audit strategy*:* It was clear from the interviews that the threat of inspection and fines played a key role in motivating cities and towns to participate in the self-audit program. Municipalities signed up to gain a period of low-inspection priority and to reduce the risk of future fines. Department managers were able to use the threat of enforcement to mobilize funds from town council or the town manager, and to underscore for employees the importance of fulfilling regulatory requirements. Unlike at colleges and universities, the role of enforcement alone in motivating action (outside of the self-audit) was less obvious from the interviews.

Deadlines and formal commitment motivated action*:* Once a town or city signed up for the audit, the official commitment to come into compliance and the looming deadline to fix violations motivated swift action and provided a compelling reason for stakeholders to prioritize compliance over other important concerns. For department managers who already had been seeking new capital funding to update facilities, the self-audit created a "window of opportunity" to bring their plans to fruition.

Participants viewed the self-audit as an "opportunity"*:* Although the self-audit strategy is largely based on the threat of enforcement, many participants praised the program as the first time the EPA worked with communities, not against them, to help them "proactively" achieve compliance. This has to do with the way the EPA and the APWA framed the self-audit as an "opportunity" for communities to get their houses in order, and contrasted the self-audit with the option of immediate inspection. Participants expressed gratitude for the opportunity to be proactive in complying with requirements. Non-participants did not express the same enthusiasm for this "opportunity".

Flexibility with deadlines increased participation*:* EPA's flexibility in offering extensions appears to have enabled a greater level of participation than would have been possible under strict deadlines. Cities and towns face unique time constraints in mobilizing funds and gaining mandates through the necessary political or bureaucratic processes.

APWA partnership increased EPA credibility and connected EPA with the "right" people: The American Public Works Association (APWA) helped the EPA to reach key stakeholders at DPWs and lent credibility to the self-audit initiative by promoting it. Rick Stinson, Past President of the APWA, commented: "We offered to do education programs because they weren't reaching the right people. They were reaching mechanics, not the DPW directors." Similarly, collaborating with the states improved outreach. There may be other parties, such as insurance companies, that could also be tapped to promote participation and compliance.

Self-audit initiative filled gaps in knowledge: Where a key barrier to compliance at municipal facilities is ignorance of the rules, the self-audit was an effective mechanism for increasing knowledge of the regulations among municipal staff and management. Private consultants played a key role in filling knowledge gaps, and they did not miss the opportunity to promote the self-audit. With a strategy so dependent on private consultants, the EPA needs to pay attention that the consultants are sharing the correct information.

One-time effort provides many lasting benefits, yet ongoing barriers to compliance remain: The self-audit is a tool for mobilizing a one-time effort to implement new procedures, update facilities, and inform managers and employees of the rules. Many changes made may provide lasting benefits. For example, a new shed will provide ongoing protection against spills into the environment; some facilities will continue their new procedures and regular self-inspections; and the training provided to staff will equip them with tools they can continue to wield to achieve compliance. In addition, many directors said they will continue to engage their consultants to maintain compliance. At the same time, as buildings, sheds and containers continue to deteriorate, new regulations come on line, facilities take on new activities, and staff become complacent about fulfilling requirements, the self-audit itself does not provide a mechanism for addressing these future issues. Many directors expressed concern about meeting these future challenges – especially if the EPA turns its attention away from municipalities.

The majority of towns did not participate, and they appear to range from highly compliant to highly non-compliant, facing similar barriers to compliance as participants do: Non-participating towns represent the gamut of compliance possibilities. Some are highly compliant; some are close to compliance but may have certain inadequacies; some may have serious compliance violations and not know it; others may be hiding their violations from regulators. The barriers they face in maintaining compliance are largely the same as for participants – ignorance of regulations, cost, and employee buy-in. More than participants, though, many non-participating managers appear highly critical of environmental regulations and regulators. Securing their "buy-in" may pose a unique challenge for regulators.

7. CONCLUSIONS & LESSONS LEARNED: COLLEGES

Barriers to compliance vary in significance by college type: Interviewees reported four barriers to compliance: lack of faculty and staff buy-in, ignorance of regulations, insufficient resources, and unreasonable regulations. The significance of these barriers varied by school size. Lack of faculty buy-in was most commonly cited as a challenge among larger institutions. Smaller institutions most commonly cited insufficient resources and ignorance of regulations. There were no noticeable differences in the barriers that confronted participants and non-participants

High profile enforcement actions motivated action: The threat of enforcement actions compelled colleges to conduct self-audits and pursue environmental performance improvements prior to the self-audits. Interviewees attributed to high profile enforcement actions a number of significant changes in their departments, including larger EHS budgets and more sophisticated management of hazardous waste. Seven of ten participants interviewed said they conducted self-audits to reduce their inspection priority.

Almost all non-participants interviewed believed EPA inspections and enforcement actions posed little risk: Some non-participating schools believed their facilities were too small to attract an EPA inspection. Others believed that inspections posed little risk since their facilities were already in compliance. One college interviewed believed it would be cheaper to opt out of the initiative, remain out of compliance for a period, and risk EPA inspection.

Self-audits and EPA workshops influenced colleges' activities in ways that additional enforcement actions could not: Interviews with EHS directors and consultants suggest that EPA self-audits and workshops encouraged colleges to be proactive about improving their environmental performance. As a result of these efforts, EHS officers viewed EPA regulations as more reasonable and EPA objectives as more worthwhile. Securing the buy-in of these EHS officials is important because EHS officers who believe EPA regulation to be reasonable are more likely to pursue activities that go beyond compliance.

Self-audit initiative gave some EHS departments leverage with administrators and faculty: An EHS departments' performance is bounded by (1) its aptitude, including its knowledge of regulations, (2) the funding and staffing provided by college administrators, and (3) the cooperation of the faculty and staff (see Appendix 5). Securing the support of administrators and faculty can be difficult since they are generally less sensitive than EHS to EPA regulations and environmental concerns. Recent EPA actions gave concerned EHS departments more influence with these actors. High-profile enforcement actions and letters sent directly to college presidents raised the environmental consciousness of administrators. Self-audits and the threat of inspection allowed EHS departments to justify additional funding requests to administrators. Additionally, the self-audits and the consultants who conducted them helped EHS departments to review the hazardous waste management practices of faculty.

The program compelled many facilities directors to make their environmental responsibilities a priority: Given the competing demands on their time, facilities directors do not always give

environmental concerns the attention they deserve. By signing-up for the self-audit initiative, facilities directors fully committed themselves to their environmental priorities.

***Participants reported that self-audits produced slight performance improvements at most colleges**:* Most colleges reported slight improvements as a result of the self-audit program. At many colleges self-audits produced capital improvements, improved regulatory knowledge, enhanced faculty or administrative buy-in, and/or temporarily increased EHS budgets. At smaller colleges, self-audits compelled facilities managers with EHS responsibilities to make environmental performance more of a priority.

Some benefits of self-audits may be temporary: Interviewees believed maintaining the momentum of the self-audit would be a key future challenge. Specifically, interviewees at smaller colleges expressed concerns about keeping up with regulations as their facilities expand and laws change.

APPENDIX 1: QUESTIONNAIRE

Questions for Participants

1. How would you characterize the challenges you face with regard to environmental compliance?

2. What kinds of interactions did you have with the EPA before the self-audit program?

3. Why did you choose to participate in the EPA self-audit program?

4. Were there individuals or organizations outside of the EPA, such as town managers/university overseers or professional associations that recommended your town/college participate in the EPA program?

5. Did you hire a consultant, if so, why?

6. How did you find the consultant?

7. I understand that different aspects of environmental compliance entail varying financial costs. Could you describe the most salient costs you see to be associated with environmental compliance at your facilities?

8. Some DPW/Colleges did not report certain violations because they fixed the violations immediately upon discovery, for example labeling containers or posting an emergency contact list. Are there examples of this at your facilities?

9. Did the self-audit program have any impact on your budget? Did it increase or decrease? If there were budget changes, will they remain in place in the next fiscal year?

10. Were there any changes in your environmental compliance procedures and management systems due to the self-audit programs? For example, did you hire a compliance officer? Did you adopt an EMS?

11. Do you think that the overall environmental performance of your facilities has changed?

12. Did the self-audit program change your perception of the EPA? If so, how?

13. In your view, has the self-audit program changed your organization's environmental performance?

14. What do you see as your key future challenges to achieving full compliance and improving environmental performance?

15. Did you perceive that there was a risk that EPA would inspect your facility? How did you perceive potential penalties associated with inspections? Have these perceptions changed over time?

16. What kind of regulatory actions would help you to increase environmental performance at your institution?

Questions for Non-Participants

1. How would you characterize the challenges you face with regard to your facilities' environmental performance?

2. What kinds of interactions have you had with the EPA?

3. Why did you choose not to participate in the EPA self-audit program?

4. Were there organizations or individuals outside of the EPA that recommended for you to participate or not participate in the self-audit program? (Consultants, town managers, university overseers, professional associations)

5. Have recent interactions with the EPA, such as receiving the letter about participation in the self-audit program, changed any of your compliance procedures. Have you made changes in budgeting, management systems or otherwise? Do you imagine that these changes will stay in place in the next fiscal year?

6. What do you see as your key future challenges to achieving full compliance and improving environmental performance?

7. Did you perceive that there was a risk that EPA would inspect your facility? How did you perceive potential penalties associated with inspections? Have these perceptions changed over time?

8. What kind of regulatory actions would help you to increase environmental performance at your institution?

APPENDIX 2: BACKGROUND, DPWS

In the late 1990s, EPA Region 1 inspected a number of municipal DPW facilities and publicized the resulting enforcement actions. Some DPW directors, never before the focus of EPA scrutiny, felt that they had not been given a fair opportunity to meet requirements about which they had never known. They appealed to the New England Chapter of the American Public Works Association (APWA) to work with the EPA to forge a more collaborative approach to environmental compliance. The APWA asked the EPA to partner with them to improve compliance at DPWs, mitigate civil penalties, and give municipalities time to perform the work. Region 1 thus developed the DPW Audit Initiative using the existing EPA Audit Policy.

The initiative gave facilities the option of conducting environmental compliance audits (usually with the help of a hired consultant), disclosing any violations to the EPA and correcting the violations in a timely manner in exchange for a reduction or elimination of fines for disclosed violations and a lower inspection priority during the audit.

Mindy Luber, then Regional Administration of EPA New England Region, sent letters to town managers and DPW directors inviting facilities to participate in the self audit initiative. The letter highlighted that EPA is seeking a penalty of $396,299 for environmental violations from the Town of Natick, and has already settled cases with the Town of Watertown and the City of Haverhill for $114,000 and $113,000 respectively.

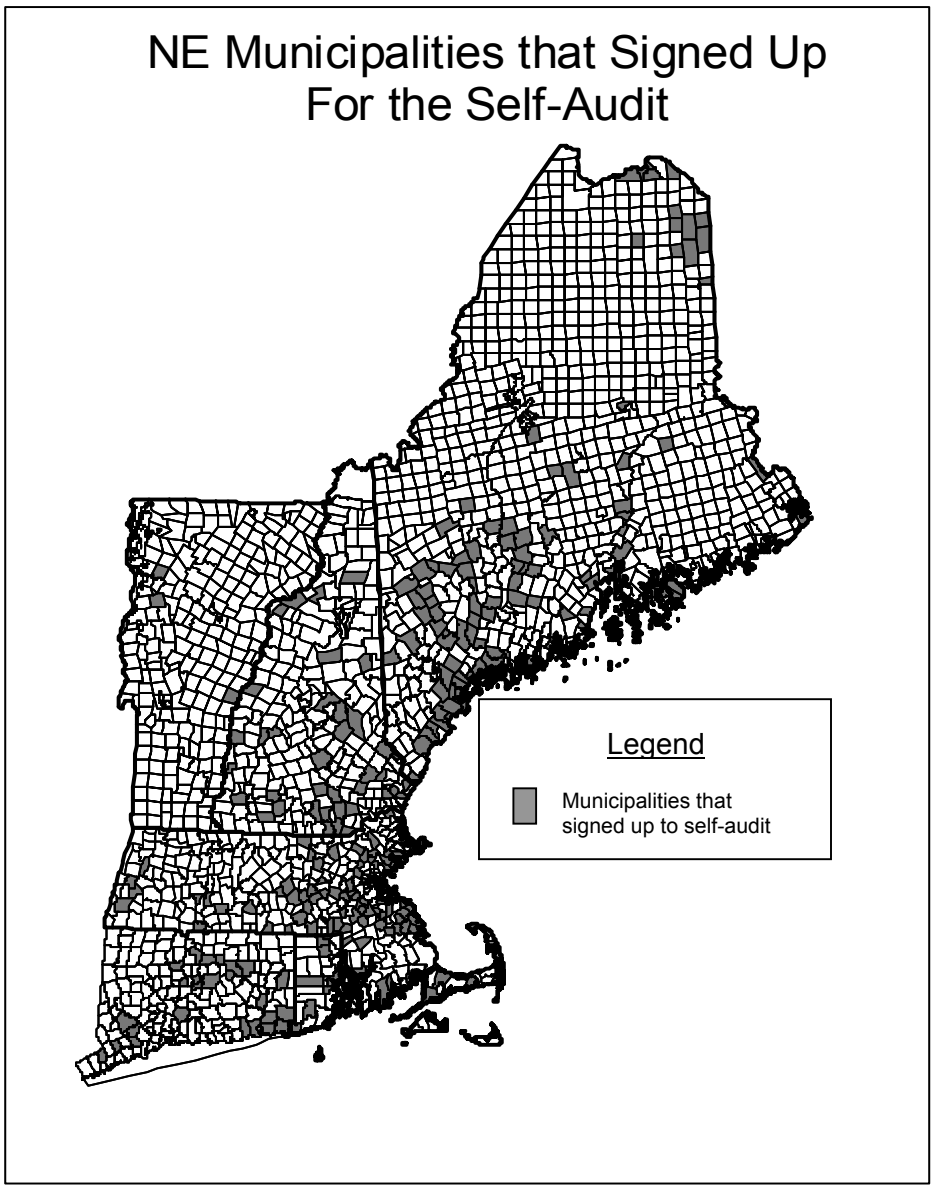
Taking a gentler approach to promoting the self-audit, the APWA invited municipal officials to its annual meeting in April 2001 that explained the audit program. APWA also sponsored workshops throughout New England encouraging participation.

Time line of the self-audit initiative:

- APWA Spring Meeting (April 2001)
- Sign-up period for facilities (April 2001 – October 2001)
- Deadline to complete self-audit (December 31, 2001)
- Low inspection priority ends for facilities reporting no violations (September 30, 2002)
- If facility discovers violations, it must disclose the violation in writing to EPA within 21 days of discovery. The facility must correct the violations in 60 days. If a facility cannot correct the violation within 60 days, it must request an extension.
- If EPA does not hear from a facility within 60 days of completion of the self-audit, the facility returns to normal inspection priority.

The EPA worked with towns to grant necessary extensions where appropriate.

Three hundred forty facilities in more than 250 municipalities signed on to conduct audits. EPA has received over 280 disclosures to date.



Common violations reported include:

- Lack of Spill Prevention Control and Countermeasure (SPCC) plans,
- RCRA violations: Container management, waste identification, and hazardous waste training and record keeping,
- Floor drain issues involving Underground Injection Control (UIC) and NPDES violations,
- Clean Air Act violations associated with vapor recovery systems.

APPENDIX 3: BACKGROUND, COLLEGES AND UNIVERSITIES

The Region 1 EPA has allocated enforcement resources for the college sector since the mid-1990's. It focused on colleges in particular for three reasons. First, colleges represent a relatively large proportion of New England's economy - 286 are located in New England. Second, colleges tend to be influential in promoting green technologies and business practices. Third, Region 1 believes that college's attitudes towards the environment will be passed on to their students – the next generation of policy-makers.

In recent years, the discovery of significant patterns of non-compliance among New England colleges and universities has caused the EPA to increases its efforts in the sector. Multi-media inspections of roughly a dozen colleges and universities revealed violations in several areas, including hazardous waste management practices, oil tank spill prevention, and storm-water requirements. As a result of these inspections, Region I EPA initiated enforcement actions against seven New England colleges MIT, the University of Connecticut, the University of Rhode Island, Brown University, the University of New Hampshire, Yale, and Boston University. These actions were settled for penalties, injunctive relief, and supplemental environmental projects which ranged between $300,000 and $850,000.[4]

Region I suspected that, despite these enforcement actions, the environmental performance of regional colleges and universities remained below acceptable standards. To determine the causes of non-compliance, Region I EPA organized focus groups with environmental personnel from regional colleges. The focus groups revealed that most colleges lacked the knowledge of environmental regulations as well as the resources necessary to maintain environmental compliance.[5]

Based on the information generated in focus group sessions Region I decided to pursue a three-phase strategy that would integrate EPA enforcement and compliance assistance efforts.

In the first phase, Region I provided the sector with accessible, "plain English" compliance information through an informational web page and multi-media workshops. Visible enforcement actions initiated during this period boosted workshop attendance. In March of 1999, After Region I sent letters describing the enforcement action and the collaborative program to every college president in the region, responses for the workshop sessions jumped from 40 to 330.[6]

In the second phase, Region 1 developed an Environmental Management System (EMS) Guide and encouraged colleges and universities to perform self-audits that would enable them to maintain and move beyond compliance. The self-audit process enables colleges and universities to identify and ameliorate current violations. Additionally, periodic self-audits are a useful tool

[4] Secunda, Joshua, "An Experiment in 21st Century Enforcement: EPA-New England's Integrated Compliance Strategy for Colleges and Universities." pp. 2-3.
[5] Secunda, p. 3.
[6] Secunda, p. 4

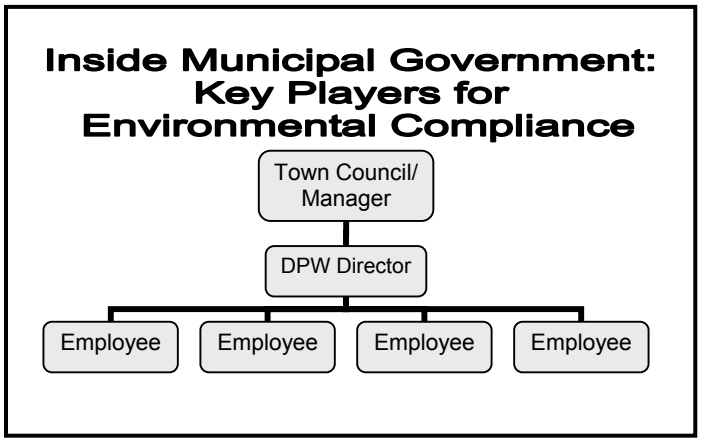
in the development of strategies that can improve overall environmental performance over time and prevent future violations. Under certain conditions, EPA's "Audit Policy" allows for penalty reductions of up to one-hundred percent for violations that are promptly disclosed and discovered by an offending organization's self-audit. In a July 2001 letter to all New England college presidents, Region 1 and state Departments of Environmental Protection (DEPs) encouraged colleges to take advantage of the EPA's Audit Policy and announced two new enforcement actions. The letter also announced that colleges could receive a low inspection priority if they participated in the self-audit initiative. The self-audit initiative ran between 2001 and 2002. Participation in the self-audit initiative far exceeded Region I expectations, with 139 colleges volunteering for the program.[7]

In the third phase, Region I is working with colleges and other stakeholders to advance conservation pollution reduction measures such as green building design and energy.[8]

[7] Secunda, pp. 5-6.
[8] Secunda, pp. 6-7.

APPENDIX 4: SOURCES OF LEVERAGE IN DPW DECISION-MAKING

The EPA self-audit strategy used sources of leverage inside and outside of municipalities to improve the environmental performance of DPWs. In our analysis, we looked at groups external to the municipality that influence DPW outcomes (see diagram) including federal agencies, state agencies, insurance carriers, professional associations, residents and more. We then looked at the key players within city government (see diagram), and found that town leaders, department managers, and facility staff all play roles in achieving compliance.



We analyzed how the EPA self-audit initiative mobilized those sources of leverage, internal and external to the municipality, to improve compliance levels. We found that through the self-audit initiative EPA mobilized the American Public Works Association (APWA) and state agencies to gain access, leverage, and credibility with DPW directors. The strategy also indirectly engaged environmental consultants who saw a business opportunity in the self-audit initiative and helped to promote it in DPWs. When towns hired consultants, the consultants appeared to help educate and explain regulations to employees. It appears that some insurance carriers may have also encouraged participation in the self-audit, although EPA did not coordinate their involvement.

The threat of inspection and penalties and the deadlines of the initiative gave directors more leverage in working with town councils, town managers, and employees. Finally, by providing an opportunity for towns to proactively achieve compliance, EPA increased the "buy-in" of department managers.

APPENDIX 5: MODEL OF COLLEGE COMPLIANCE DECISIONS

Our interviews show that pulling and hauling among EHS departments, college administrators, and faculty ultimately determines a colleges' compliance status. Because these individuals have different responsibilities and different values, they do not always agree on the appropriate level of environmental performance for their school

EHS departments and faculty determine environmental outcomes. EHS departments establish, implement, and monitor environmental management procedures. Faculty regularly deal with and dispose of hazardous wastes. EHS departments attempt to regulate the behavior of faculty by instituting guidelines for hazardous waste disposal.

The performance of EHS departments and faculty are shaped by college administrators. Administrators determine EHS budgets. They can also pressure faculty to comply with EHS guidelines.

Both administrators and EHS departments are sensitive to EPA regulations and enforcement actions. Both want to protect the safety of their communities and avoid paying large fines for regulatory violations. EHS departments are inherently more sensitive to EPA regulation because they are more knowledgeable of the threats posed by EPA enforcement actions and environmental hazards. Thus, the views of EHS officers and college administrators do not always coincide. EHS officers attempt alter the views of administrators to acquire additional funding for their departments. The interactions between these different players are illustrated in the figure below.

Model of Environmental Outcomes in College Sector

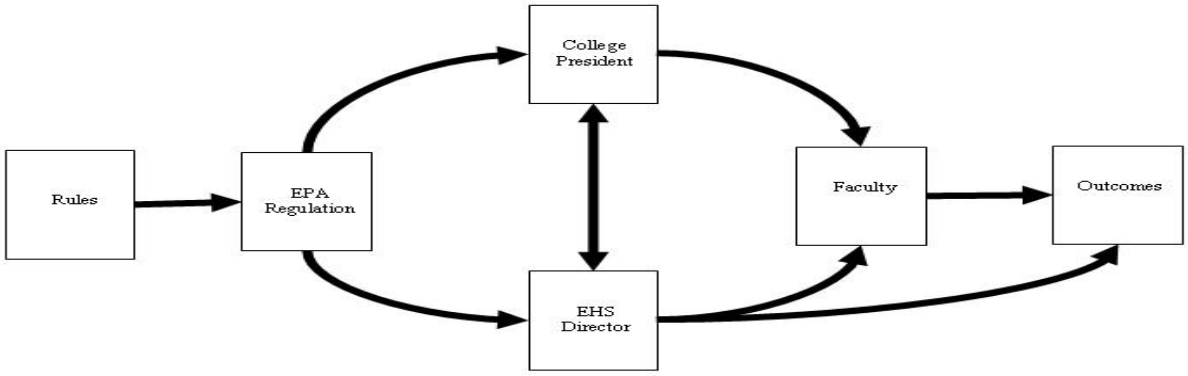


Chart adapted from: Weil, David. "Assessing OSHA Performance: New Evidence From the Construction Industry," *Journal of Policy Analysis and Management* 20.4 (2001): pp. 652-653

In part, the self-audit strategy improved environmental performance by altering the bargaining power of the actors described by this model. The strategy engaged college presidents. By making presidents more aware of the threat of enforcement action, the strategy (1) strengthened the hand of EHS directors requesting additional funding and (2) compelled administrators to apply additional pressure to faculty to comply with EHS guidelines.

The self-audit also strengthened the link between EHS and EPA priorities. After interacting with Region 1 staff through EPA workshops and other assistance programs, EHS directors gained a greater understanding and appreciation of EPA objectives. Some EHS officers adopted EPA objectives as their own, bringing them to their staff, college faculty, and administrators. In this way, EPA strengthened its relationship with its strongest advocates on college campuses.